1. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 + 15x^2 - 74x + 40}{9x^2 - 9x - 10}$$

A. Vertical Asymptote of $x = 1.0$ and hole at $x = 1.667$

B. Vertical Asymptotes of $x = -0.667$ and $x = 0.667$ with a hole at $x = 1.667$

C. Holes at $x = -0.667$ and $x = 1.667$ with no vertical asymptotes.

D. Vertical Asymptote of $x = -0.667$ and hole at $x = 1.667$

E. Vertical Asymptotes of $x = -0.667$ and $x = 1.667$ with no holes.

2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 + 37x^2 + 75x + 50}{8x^2 + 30x + 25}$$

A. Vertical Asymptotes of $x = -1.25$ and $x = -1.667$ with a hole at $x = -2.5$

B. Vertical Asymptotes of $x = -1.25$ and $x = -2.5$ with no holes.

C. Holes at $x = -1.25$ and $x = -2.5$ with no vertical asymptotes.

D. Vertical Asymptote of $x = -1.25$ and hole at $x = -2.5$

E. Vertical Asymptote of $x = 0.75$ and hole at $x = -2.5$

3. Which of the following functions *could* be the graph below?
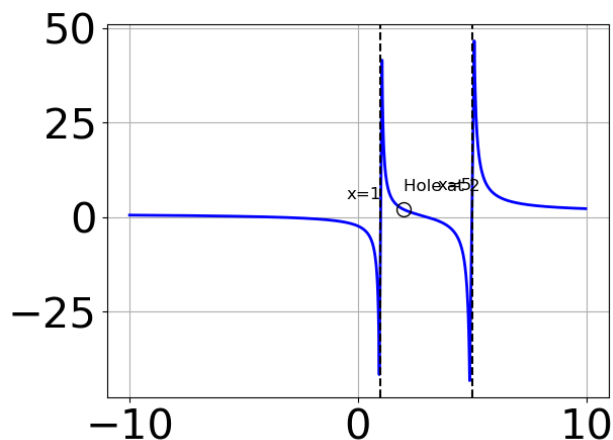
A. $f(x) = \dfrac{x^3 + 5.0x^2 - 18.0x - 72.0}{x^3 + 8.0x^2 + 17.0x + 10.0}$

B. $f(x) = \dfrac{x^3 - 1.0x^2 - 14.0x + 24.0}{x^3 - 8.0x^2 + 17.0x - 10.0}$

C. $f(x) = \dfrac{x^3 + x^2 - 14.0x - 24.0}{x^3 + 8.0x^2 + 17.0x + 10.0}$

D. $f(x) = \dfrac{x^3 + 3.0x^2 - 10.0x - 24.0}{x^3 - 8.0x^2 + 17.0x - 10.0}$

E. None of the above are possible equations for the graph.

4. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{5x^2 + 23x + 12}{15x^3 - 56x^2 + 21x + 36}$$

A. Horizontal Asymptote of $y = 0.333$ and Oblique Asymptote of $y = 3x - 25$

B. Horizontal Asymptote of $y = 0$

C. Horizontal Asymptote of $y = 0.333$

D. Oblique Asymptote of $y = 3x - 25$.

E. Horizontal Asymptote at $y = -4.000$

5. Which of the following functions *could* be the graph below?
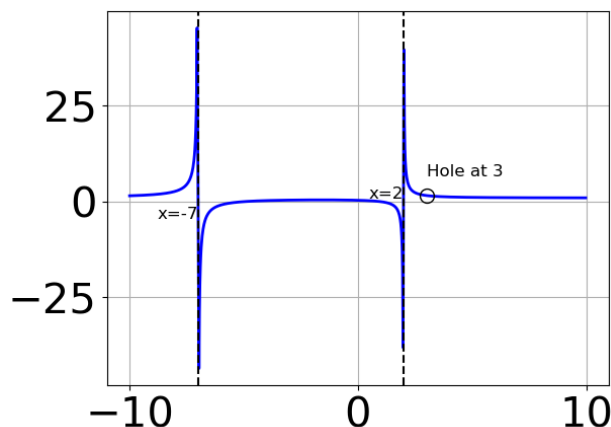
A. $f(x) = \dfrac{x^3 - 1.0x^2 - 17.0x - 15.0}{x^3 - 2.0x^2 - 29.0x - 42.0}$

B. $f(x) = \dfrac{x^3 + 8.0x^2 + 11.0x - 20.0}{x^3 + 2.0x^2 - 29.0x + 42.0}$

C. $f(x) = \dfrac{x^3 + 2.0x^2 - 29.0x - 30.0}{x^3 - 2.0x^2 - 29.0x - 42.0}$

D. $f(x) = \dfrac{x^3 + x^2 - 17.0x + 15.0}{x^3 + 2.0x^2 - 29.0x + 42.0}$

E. None of the above are possible equations for the graph.

---

6. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{4x^3 - 16x^2 - 25x + 100}{4x^2 - 4x - 15}$$

A. Vertical Asymptote of $x = 1.0$ and hole at $x = 2.5$

B. Vertical Asymptotes of $x = -1.5$ and $x = 2.5$ with no holes.

C. Holes at $x = -1.5$ and $x = 2.5$ with no vertical asymptotes.

D. Vertical Asymptotes of $x = -1.5$ and $x = -2.5$ with a hole at $x = 2.5$

E. Vertical Asymptote of $x = -1.5$ and hole at $x = 2.5$

7. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{2x^2 + 9x + 10}{12x^3 - 8x^2 - 135x - 100}$$

   A. Horizontal Asymptote of $y = 0.167$

   B. Horizontal Asymptote at $y = -2.000$

   C. Horizontal Asymptote of $y = 0.167$ and Oblique Asymptote of $y = 6x - 31$

   D. Oblique Asymptote of $y = 6x - 31$.

   E. Horizontal Asymptote of $y = 0$

---

8. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{16x^3 + 16x^2 - 9x - 9}{8x^2 - 14x - 15}$$

   A. Vertical Asymptote of $x = 2.0$ and hole at $x = -0.75$

   B. Vertical Asymptotes of $x = 2.5$ and $x = 0.75$ with a hole at $x = -0.75$

   C. Holes at $x = 2.5$ and $x = -0.75$ with no vertical asymptotes.

   D. Vertical Asymptote of $x = 2.5$ and hole at $x = -0.75$

   E. Vertical Asymptotes of $x = 2.5$ and $x = -0.75$ with no holes.

---

9. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{16x^3 - 16x^2 - 25x + 25}{4x^2 - 21x + 20}$$

   A. Horizontal Asymptote of $y = 4.0$

   B. Oblique Asymptote of $y = 4x + 17$.

   C. Horizontal Asymptote at $y = 4.0$

D. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x + 17$

E. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x + 17$

---

10. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 + 11x^2 - 45x - 50}{3x^2 - 7x - 20}$$

A. Horizontal Asymptote at $y = 4.0$

B. Oblique Asymptote of $y = 4x + 13$.

C. Horizontal Asymptote of $y = 4.0$

D. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x + 13$

E. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x + 13$